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THE JOURNAL OF DENTAL EDUCATION

A QUARTERLY FOR THE DENTAL TEACHER

VOLUME 17 MARCH, 1953 NUMBER 2

"An ignorant man has been defined as one whom
God has packed up and men have not unfolded."
NEWELL DWIGHT HILLIS

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A Conference Session will be held during the 1953 Annual Meeting on dental hygienist educational programs. A committee has been appointed to conduct the Session: Margaret A. Bailey, Evelyn Hannon, Margaret E. Swanson, Gerald D. Timmons, Temple University, *Chairman*.

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The primary aim of education is to put the funded experience of the race at the disposal of those who are about to enter upon the adventure of responsible life.

—Hough.

EDITORIALS

The Education of A Dental Student

Unesco Plays a Part:

Under the title, "Occasional Papers in Education," a 37-page booklet is available at a cost of "two bits,"[1] which presents several different aspects of the "Role of Museums in Education," although none dealt with dental education, *per se*, yet it is an easy task to draw a parallel and realize the value in our own field. One speaker, Dr. Allan, in his introductory remarks, suggests:

"Education is prime social service," and in any society there are:

1. Individuals with knowledge—teachers
2. The rising generation—the taught
3. The orderly building up of ideas—the one fundamental principal of sound education.

"Museums," he says, are "indispensable adjuncts" as repositories "for raw material of all sciences and some art—instruments and products" of the past, and art, by which real understanding of man is conveyed to man so that the present comprehends more fully the minds and labor of men of yesterday. At one time man depended on "dumb show or force of example—protected by ritual (or otherwise)" then "spoken language" and finally "writing"; the museum demonstrates all of this and things to be learned become more vivid.

The "Art Gallery" is in a sense the highest form of museum, but again parallels may be drawn and each field of interest may be inspected as from the standpoint of art for in its last analysis art is the emotional appreciation of things seen or handled, whether it be architecture, paintings or instruments used in the healing profession. In these we see the finest expressions of the mind of man in eras gone before and the more we can appreciate men and things as they have developed or

> "For once, we shall not examine his intelligence or his memory,
> But shall appeal to his heart,
> That's the secret of all aesthetic emotion."
>
> (Denise Mahler)

This booklet, in addition to discussions of various aspects of museums, carries a good bibliography and some notes of the authors. It can serve a good purpose in building up any museum anywhere and now as the American Dental Association may shortly begin a survey among our schools, we might well take advantage of this knowledge.

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[1]Unesco, New York Office, a series of papers presented at an International Seminar, Brooklyn Museum, Brooklyn, New York, September 14 to October 2, 1952.

United States vs. The British System

Under the caption, "Dental Education in the United States of America," Hardwick[1] presents the story of his recent visit to the United States and a study of our dental schools. Judging from the length of his report, not to mention the detail into which he has gone, a very thorough job appears to have been done.

At the outset he stated a very important administrative difference between the two systems and which in many instances might be overlooked as one having value. The difference referred to is primarily a difference in our national governments—theirs being national while ours is federal. That is to say, in a very limited way any one of our states might be contrasted with their total government, for our national governing bodies have constantly to avoid complication with the state and state's rights, and much that we may do nationally must have state approval. Especially would this be true in the educational field. Therefore, we do not nor will not have a General Dental Council. Our Dental Educational Council can only be advisory and the same principle applies to boards of examiners or other analogous bodies. We believe this to be good procedure for thus we become cooperative and none is compelled. Our council is professionally and not governmentally appointed.

At any rate all of his story is interesting to read and should provide us with a clear understanding of what we do, how we do it, and of the results. To read Dr. Hardwick's story will be to increase our own appreciation of it all.

One point more he brings out, namely, "The American dental student is the better technician but the English student has a broader understanding of the basic sciences. . . ." This is no doubt true as of today. It has been the fact over the years for as far back as 1838, at the age of 23, Horace Wells stated:

> "In Europe, most educated men are not only well educated, but, in multitudes of instances, are educated veterans; and young men before they presume to cope with them for public approbation, must pass, not only four or six, as in this country, but actually twelve, fourteen or twenty years in universities."

Of course, systems have changed since then, both in the United States and Great Britain, so that this length of study may not appear so extravagant today. At the same time American dental education is devoting more and more time to the sciences of what-so-ever designation, and are now studying diligently the question of corelating the scientific and the technical aspects, that the dentist may in truth render a better service and that his efforts in the area of prevention may be more effective.

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[1]Hardwick, J. L.: *British Dental Journal*, 93, 125; 1952 (September 2).

The technical aspect must always be advanced, for the time will not come when technical procedures become relics of the past, but on the contrary, better technical procedures will be demanded, and a better knowledge of the sciences is required for this. Concomitantly, however, the profession is now well into the area of prevention and a better knowledge of the sciences is essential for the prevention of disease.

The study and report made by Doctor Hardwick is quite complete, is a valuable contribution to dental education in both countries and very fair indeed.

Five Points for Teachers to Consider:[1]

1. How students feel about us
2. How fellow-teachers take us
3. What administrators say about us
4. What impressions parents have of us
5. What is the attitude of the (general)[2] constituency

[1] *Phi Delta Kappan* (Phi Delta Kappa Fraternity) education, 34, 178, 1953 (Feb.).
[2] Not in original.

SOCIAL CASE WORKER IN DENTISTRY[1]

HOWARD M. MEYERS, D.D.S.,[2] *San Francisco*

The earliest scientific inquiry was directed toward natural phenomena which were remote from man's mode of living. In this manner, astronomy, physics, and mathematics had their beginning as the chief studies of the ancient scholars. With the passage of time, inquiry became more introspective and concerned itself more and more with human problems. Congruously, morphology was studied long before much attention was given to such things as psychology. The more recent acquisitions of knowledge have included the social relationships of human beings.

Dentistry as a branch of science has undergone a metamorphosis in the same direction. What began as an essentially mechanical field has grown to embrace physiological and biological principles as well. It is in keeping with this trend that we should anticipate finding greater emphasis on the individual patient's personality in future dentistry. The most obvious vehicle for progress in this direction is the social case worker. These individuals, by means of an interviewing technique, try to determine the particular aspects of the patient's background which may be decisive in preventing his cooperation. By having his attention directed to these points, the patient gains a better insight into the nature of his problem, and is more able to adjust to his difficulties.

In medicine, the role of case workers has been beneficial enough to establish their place in any institution offering a complete health service. It is only reasonable to conclude, therefore, that those facets of dental treatment which depend on patient cooperation will be made more effective by the services of well trained social workers. Dietary restrictions and home care of teeth and gingivae are two obvious fields where significant improvement may be expected. It is encouraging to find that pioneering efforts have been made to employ social case work at the Walter G. Zoller Dental Clinic in Chicago. The results of these efforts on the success of dental treatment will be watched with interest.

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[1]The paper accompanying this statement appeared to be of such importance to the editor, that Dr. Meyers was asked to write it. (Ed.)

[2]Division of Dental Medicine, College of Dentistry, University of California.

FUNCTION OF A SOCIAL WORKER IN WALTER G. ZOLLER MEMORIAL DENTAL CLINIC, UNIVERSITY OF CHICAGO CLINICS

PHYLLIS WEXLER, M.A., and ELIZABETH McKINLEY, M.A.[3]

The Walter G. Zoller Memorial Dental Clinic was established at the University of Chicago Clinics in 1936 to provide dental treatment for persons dentally indigent, and to provide opportunity for education and research in the various scientific fields concerned with treatment and prevention of oral disease. Due to the leadership of the director, Dr. James R. Blayney, the firm belief and philosophy that prevention is a part of treatment and that dental health means looking at the whole individual, his family and his community, permeates the clinical practice. It was natural, therefore, to consider if a medical social worker should be a part of the clinical team. Since this was a departure from the usual organization of a dental clinic, a part time worker was employed until 1948. By that time it had been demonstrated to all concerned that the social worker was a necessary member of the clinical team and to meet the needs in this particular clinic a full-time worker was required. This experience has also shown that the worker functions here as a medical social worker does on any hospital or clinical service.

The unique responsibilities of a medical service have a definite effect on the role of the medical social worker. Zoller Clinic, because of its preventive philosophy and of its teaching and research responsibilities, has specific oral health requirements which demand a high degree of cooperation and self-control on the part of patients and/or their parents. Appointments must be kept regularly and promptly, good oral hygiene habits must be maintained and the intake of sweets must be greatly restricted. We now know that food, its giving and withholding, has much emotional significance, and the significance differs from individual to individual. The limiting of candies and other concentrated forms of sugars is especially difficult since sweets are so commonly regarded as treats and rewards. Therefore, the diet recommendations of this preventive dental program frequently conflicts with the emotional needs, or the family or cultural patterns of the patient. The social worker's job in this clinic is to help the patient find a way whereby he can follow the caries control program and not increase, but hopefully decrease the difficulties in his life adjustment. In addition to the particular requirements of this particular dental clinic, most patients have the dread or fear of dentists which seems to be a fairly common feeling.

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[3]Director, Social Service Department, University of Chicago Clinics.

If the fear does not abate under a relatively benign experience, if the patient continues to react out of proportion to what is happening to him, it is necessary to look further for the reasons. It is at this point in Zoller Clinic that the patient will be referred to the medical social worker.

In order to describe the activity and participation of the medical social worker in Zoller Clinic, a study was made of seventy patients referred to her during the year 1949. The main points studied were: reasons for referral, social and personal problems revealed and their relationship to the patient's cooperation, the worker's activity and effectiveness in helping the patients to deal with these problems. This paper is a summary of the findings of that study.

The age groups of the patients are as follows:

42 under 13 years of age
12 were 13 to 18
3 were 18 through 21
13 were 21 and over

Characteristics of Referrals

The major source of referral to the social worker is the dentist. Financial eligibility for dental care is determined by the University Clinics admitting office. The dentist examines the patient and determines if he is dentally eligible and he may then refer the patient to the social worker to determine if he is socially eligible. These referrals are not automatic, but depend on whether the dentist questions if the patient may find it difficult to follow the clinic recommendations. When the dentist refers a patient for social evaluation it is expected that the social worker will interview the patient and/or parents, review previous clinical records, including the social records, of the patient and family members, and on the basis of these findings predict whether or not the patient will be able to follow the clinic recommendations. If the findings indicate that the patient will have difficulty, then the social worker must determine, to the best of his ability, what the stumbling blocks are and in what way he and the other members of the clinic team can help the patient and family with them. If it seems doubtful that the patient can use help in cooperating with the dental program, the findings are discussed with the dentist and the joint decision may be that the patient is socially ineligible. He will then be referred to another community resource for the necessary dental care.

Reasons for referral are divided into four groups:

Group I—for social evaluation at the time of the first clinic visit and with no problems stated by the dentist.

Group II—for social evaluation at the time of the first clinic visit with problems noted by the dentist.

Group III—for social evaluation during treatment because of the emergence of problems noted by the dentist.

Group IV—for miscellaneous reasons.

Of the patients, 45 or 64 per cent were in Group I, 6 or 8½ per cent were in Group II, 11 or 16 per cent in Group III, and 8 or 11½ per cent in Group IV. That is, the largest percentage of referrals were for social evaluation without any additional information or problem specifically stated by the dentist, although he obviously had questions in his mind at the time of making the referral. This means that in over half of the cases referred to the social worker the patient had expressed no need for help in any area, the dentist had stated no specific problem, and the social worker's function in the eyes of the patient was not too clear.

It is rare for the worker to see a patient who comes because he is requesting help with some definite social problem. Of these 70 patients referred, 66 or 94 per cent came to the social worker because someone had requested that they do so. Four of the 70 patients, or 6 per cent, did come with some specific problem in mind. Of the 66 patients who themselves had no stated problem at the time of referral to the social worker, after exploration problems became evident in 37 or 56 per cent. Sometimes they were recognized in the first interview, sometimes not until later. Twenty-nine patients, or their parents, never did bring out problems, although in 22 of these cases it was quite evident that there were difficulties both in relation to the Zoller dental program and life adjustments. Patients in a dental clinic reflect the general lack of understanding of social work beyond supplying material assistance. Also any patient has his need for medical care uppermost in his mind and does not think of the possible interrelationship between some of his social and personal problems and his ability to follow medical recommendations. It is, therefore, important to transmit to the patient, in a more effective way, an understanding of the social worker as a helping person in his total medical or dental care.

Problems Affecting Cooperation

Although 70 patients were referred during this period, this study of problems and their relationship to cooperation with the dental program

is limited to 41 children as not enough information is available on the remainder for valid conclusions. The problems have been classified and identified as follows:

I—negative attitude toward or previous neglect of dental care
II—difficulties in inter-family relationships
III—social and environmental problems
IV—serious medical or crippling conditions

Difficulties in all of these first three "problem categories" were present with at least three-fourths of these 41 children. To determine the relationship between the presence of these problems and their cooperation in the clinic, their degree of cooperation was rated. Group A includes those patients who showed acceptable cooperation with the clinic with respect to clinic appointments, oral hygiene, and nutrition. Group B includes those patients whose cooperation was acceptable with respect to one or two aspects of this program but not all three. Group C includes those patients whose cooperation was not acceptable. This classification was done in consultation with Dr. James R. Blayney, director of Zoller Clinic. The first three of these "problem categories" occurred in all groups in high percentage, but the percentage was less for Group A, the most cooperative group. The occurrence of these problems was in direct proportion to the cooperation ratings, and seem consistent enough to suggest that there is an interrelationship.

One-third of the patients in Group A had serious medical problems (Category IV), which suggests that when there is a serious medical problem the family is more likely to be concerned about oral health and hygiene also.

In tabulating the problems in relation to cooperation, those classified in Categories II and III occurred most frequently. A further breakdown in Category II revealed the importance of parent-child, and particularly mother-child relationship. The child is unable to control his own behavior and the parent is the controlling authoritative and behavior-setting person. Some of the factors in this category were:

On the part of parents:

Mother immature and unable to really "give" to her child
Mother unable to deprive or deny child
Mother assumes no responsibility for dental program and places it all on the child
Open or concealed rejection of child by either parent
Unhappy or unsatisfactory relationship between parents
Mental or serious physical illness of a parent

On the part of children:

Feeding problem
Extreme rebellious behavior toward parent
Persistent thumb sucking
Prolonged fear of men, hospital, doctors, needles, etc.
Persistent enuresis
Extreme craving for sweets

The presence of any of these factors does not necessarily mean that the patient will be uncooperative, but they do raise warning signals for the social worker in her handling of the patient, and for the dentist in his handling of the patient.

The breakdown of Category III shows the following social problems:

Serious illness of a parent or pregnancy of mother
Both parents employed and child alone after school
Long distance from clinic
Birth of a new sibling
Mother burdened with many family responsibilities

It is our experience that where these factors interfere more than temporarily with a patient's cooperation, factors noted in Categories I and II are also present.

Effectiveness of the Medical Social Worker

It should go without saying that the attitude and understanding of the dentist is one of the vital factors in effecting the patient's cooperation, as well as the patient's capacity for handling his social, personal and dental, problems. This study gives us an opportunity, however, to analyze more specifically the medical social worker's role in the clinical team. She is one member of the clinical team and her process involves a continuing reporting back to and consulting with the dentist responsible for the patient's care.

Two major areas were considered in attempting to describe and evaluate the worker's role: her helpfulness in facilitating the patient's cooperation with the dental program, and her helpfulness to patients in other areas of their life situations. The two are inter-related and often assistance with difficulties in the life situation will result in improved cooperation with the clinic program. Determination of whether or not the worker's activity was effective was based on noted improvement in the patient's cooperation with the dental program and/or noted improvement in the patient's life situation. This evaluation is necessarily a subjective one.

In the 41 cases under consideration, the medical social worker was

effective in securing improved cooperation with the dental program with 13 patients, was helpful in improving adjustment to life situation with 22 patients and was not effective in either area with 18 patients. Another kind of breakdown indicated that effective assistance with both dental and life problems was given to 12 patients, with only dental problems to one patient and with only life problems to 10 patients, and no effective assistance in either area to 18 patients. Three of these 18 patients gave excellent cooperation with the clinic program and it was quickly established after the original referral that there was no need for the worker's service. Twelve of the 18 patients gave acceptable cooperation. In the majority of these cases there were observable difficulties in life adjustment, as was true with the three patients whose cooperation was rated not acceptable. In these 15 instances, neither the mother nor the patient were able to use the worker's proffered help and the worker was unable to establish any kind of satisfactory working relationship.

Working Process of the Medical Social Worker

When the patient is first referred the worker is expected to learn, from the dentist and the medical chart, what the dental and medical problems are and the anticipated plan of treatment and what participation should be expected of the patient. During the first and succeeding interviews the worker looks for positive factors as well as possible problems. Some of the positive factors found in the patients referred are:

1. A stable, well-integrated family with no real difficulties in inter-family relationships.
2. Demonstrated interest on the part of the patient or parent in following the clinic program.
3. Continued assumption of responsibility on the part of the patient or the parent in maintaining his share of the treatment and prevention program.
4. Good nutrition history and good or fair health habits on the part of the patient and his family.
5. Recognition of social or personal problems which are hampering the clinic program and/or the life adjustment on the part of the patient or his parent accompanied by the desire for and ability to use the help of the social worker.
6. Cooperation of the school and others closely associated with the patient.

Also during the first few interviews while the worker is getting to know the "patient as a person," learning his particular situation and his concern with his particular dental problem (the social evaluation process), some time is given to a discussion of dental health as a follow-up of the dentist's talk with the patient and his parent. She reviews the

recommendations the dentist has made, tries to elicit the patient's understanding of them and what he thinks of his ability to carry through the program. This serves several purposes. The repetition more or less re-phrases and reinforces what the dentist has told the patient, helps to clarify for him and for the social worker what blocks might prevent follow-through on the program and helps to keep the patient or parents from being overwhelmed by what they have to do. Further, they begin to realize and integrate the implications of the program and learn that there is help available in carrying it out. Usually, in this first interview (unless the parent is very defensive) the worker will make some concrete suggestion to the parent so the child can more easily do what the dentist suggests.

In working with individual patients and their families the focus is centered on those aspects of the patient's life situation which are interfering with cooperation with the dental program. No attempt is made to work with total problems or deep-seated unconscious ones. Success depends on the medical social worker's ability to establish a relationship with the patient and/or his parents, and their ability to see a problem and use help with it. This help is accomplished through case-work service, or counselling. This may be further defined as assistance to the family in thinking about, talking about and thus examining and clarifying some of their problems. Through that process of examination and clarification they may gain enough understanding and objectivity to be enabled to do something about it. Sometimes it is indicated that the worker give the patient or his family direct advice, sometimes it is indicated that the worker needs to help the patient or his family make effective use of appropriate community resources. Sometimes the service given by the worker is focused on helping the patient or his family see what some of the factors are within themselves which are creating their difficulties, and what they can do about them. This is not an attempt to have the patient understand or reveal his deep underlying conflicts, but to help him have a better understanding of some of his behavior. Since only three of the patients studied fell in this grouping, it can be assumed that this kind of service on the part of the medical social worker in the dental clinic is not numerically large. However, of necessity, much time is spent with this kind of patient, both in direct contact with him and in consultation with the dentist, supervisory worker and psychiatrist. Time is also required for recording in the medical chart for the dentist's use and for the permanent record, and for more detailed recording on certain patients in a supplementary social service record for the worker's analysis and planning next steps.

In addition to working with individual patients, the worker participates in the dental health education program which is one of the important preventive activities of the clinic. This is a discussion group for mothers, led by Dr. Blayney, and held several times a year. The worker helps in deciding who shall be invited and does the inviting by phone, in person, and by letter. Explanation and discussion about the mothers' discussion group is sometimes a useful device in eliciting more interest and more cooperation from the mother with both the dentist and the worker. The discussion itself is definitely fruitful and productive of better understanding and cooperation. Over a period of two and one-half years, 85 mothers have attended, which is 54 per cent of those invited.

In summary, no generalization or formula is possible as to which patient or family will be able to cooperate with the Zoller dental program. It is necessary to have an individual social evaluation of each patient and his family which includes eliciting the positive factors as well as the personal and environmental problems. The medical social worker's activity is dependent upon these findings, the dentist's use of them in his dealings with patient, and his consultation with her, and the patient's and/or his family's desire and ability to use her help. Her specific activity is appropriate to the patient's needs and her focus is maintained on the problems around the patient's dental care.

Three Prime Attributes of a Teacher:[1]

1. Knowledge of his subject
2. Ability to present his subject
3. Personality to hold his listeners

[1]Allan, D. A.: Unesco, Occasional Papers in Education, July 25, 1952.

THE PREPARATION OF THE FIRST YEAR DENTAL STUDENT FOR THE STUDY OF CROWN AND BRIDGE PROSTHESIS[1]

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The first year dental student takes 225 hours of laboratory work and 15 hours of lecture in courses described as "Dental Morphology" and "Applied Dental Anatomy." Of the 225 laboratory hours, 90 hours are devoted to tooth carving exercises (dental morphology) and 135 hours are devoted to articulation of cast crowns (applied dental anatomy). These courses are prerequisite requirements for second year crown and bridge and operative courses.

The courses are designed to present both a theoretical and a practical study of the morphology of both permanent and deciduous teeth.

The theoretical aspects deal with the specialized forms and surfaces of permanent and deciduous teeth; their structure, composition, classification and recognition. The relation of the individual tooth to adjacent and opposing teeth and to its supporting tissue, and the active functions of mastication are studied.

The practical aspects include instruction and training in carving reproductions of model teeth, and the preparation of full veneer crowns on a fully adjustable articulator in functional and anatomical relationship with one another.

Teaching Material

The highly precisional nature of the technical aspects of these courses suggests the advisability of utilizing effective and efficient audio-visual aids. Some of the aids used in the courses are:

Large six diameter plaster model teeth.
Slides portraying 448 different views of the 32 teeth in the arch.
Accurate precise models of technic requirements.
A fully adjustable articulator containing crowns and bridges carved, cast and adjusted to precise functional interrelation.
A large collection of selected extracted teeth for use in nomenclature and identification exercises.
Approximately 120 slides showing various views of student technic.
Models of student technic in the various classifications of quality.

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[1]Read before the Section on Crown and Bridge Prosthesis, American Association of Dental Schools, Colorado Springs, March, 1952.

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Approximately 100 slides of practical esthetical cases involving crown and bridge prosthesis.
Approximately 500 slides of pathological and malocclusion cases.
Two models of practical cases involving full mouth rehabilitation.
Access to use of approximately 15 motion pictures of crown and bridge prosthesis.
The textbook of "Dental Anatomy" by Zeisz and Nuckolls.
The laboratory manual on tooth carving procedure.
Student progress and evaluation charts.

Teaching Procedure

A specific teaching plan is followed in the presentation of new or different technical exercises. This plan is outlined as follows:

Show the goal or objective desired in its most perfect form.
Explain and illustrate the procedure involved in achieving the objective.
Demonstrate the procedure to small groups.
Assist and instruct the student.
Supervise his performance.
Conduct class discussion of common problems.
Complete student technic.
Evaluate technic.
Inform students of evaluation.
Permit students to correct sub-standard performance.
Test performance.
Review test results.

This procedure is designed to minimize the loss of time resulting from insufficient knowledge of the exercise or its performance. Trial and error teaching is not used in the introduction of new technics at the first year level, but can be used in the performance exercises subsequent to the introduction of new technics.

Teaching in crown and bridge prosthesis involves the introduction of a new procedure followed by considerable experimentation, performance and practice of the specific technic; therefore, greater effort applied during the introductory phase can be compensated by the reduced need of teaching time during the training exercises.

Specific Teaching Procedures

The preparatory courses for crown and bridge involve the use of teaching procedures which seem to be specifically adapted to the specialized requirements of these courses. During the past four years many teaching techniques have been tried with varying successes. Those procedures which seemed best suited for our particular purposes were retained, and will be discussed individually.

Use Sound Motivation Methods

Since the first year dental student has little conception of the procedure for preparation for crown and bridge prosthesis, motivation is indicated. During the first week of instruction the student's interest is activated by the following method:

A full length 16 mm. sound color motion picture of the construction of a fixed bridge in the mouth is shown.

Models of the technical requirements of the course are then displayed.

A small natural sized precisely carved and mounted wax tooth and its large six diameter plaster model are then shown. This represents the first exercise be performed by the new student, and the accuracy of the small wax reproduction of the anatomy of the large model is pointed out.

The importance of the exercise of carving the small wax tooth and its application to the construction of the bridge in the movie is explained.

Teach from the Simpler to the More Complex Procedures

In accordance with the principles and psychology of learning, the simplest procedures are introduced first. These are followed by increasingly more complex technics. Using the tooth carving technic as an example, it is suggested that the students learn the handling and use of instruments first. Simple carving and adding exercises are then given, and the student is presumed ready to begin the tooth carving exercises. These exercises should involve the carving of the simplest teeth first and the more difficult last; that is, the centrals and laterals, the cuspids, the bicuspids, and finally the molars.

Use Stimulative Teaching Methods

It has been observed that repeated exercises of the same technic result in a diminution of interest and learning efficiency. This is particularly true in tooth carving exercises wherein students are required to carve the various teeth in the arch during consecutive laboratory periods. In order to increase the effectiveness of the teaching processes the courses in Dental Morphology and Applied Dental Anatomy are in effect joined into one combined course. After approximately two-thirds of the tooth carving requirement is completed the students are introduced to the technic of mounting and articulating a set of typodonts. This introduces the subject of occlusion. Next, four crowns are waxed, cast and functioned on the articulator. The student then returns to the tooth carving exercise and completes the carving of the molars. After this he reverts back to the articulator technic and carves and casts the remaining four molar crowns. This intermixing of the articulation and carving technics increases interest and encourages efficiency.

Select and Use Materials That Have a Practical Relationship to Dentistry

Wax should be the material of choice for the tooth carving exercises. Crowns should be carved in wax and cast in gold or a suitable technic metal. If possible, a fully adjustable articulator should be used for the articulation exercises. Transfer of learning is facilitated when a correlation exists between the materials used in teaching and in practice.

Display Accurate Models of Student Technical Requirements

In order to teach precision the teacher must be able to refer to perfect models. Carved teeth and cast and polished crowns are things of beauty and art and as

such are better seen than explained. A student is more easily motivated if he can see the goal in its ideal form. Crown and Bridge Prosthesis is particularly conducive to this form of demonstration.

In our courses a complete set of wax teeth and a set of cast crowns in function on an articulator are on display accessible to the students at all times. These ideal models have been carefully prepared and are presumed to be accurate in every respect. Perfection is a very important consideration, since students give evidence of being observant and critical of guide models.

Utilize the Art of Drawing as a Teaching Instrument

One of the most effective and efficient teaching aids for the courses in Crown and Bridge Prosthesis is the art of drawing. Explanation of the technical aspects of laboratory work should be accompanied by their demonstration. Slides, charts, models and the like are effective teaching aids but the need to supplement these aids is obvious. Spontaneous demonstration is adequately satisfied by use of the blackboard. If possible every teaching laboratory should have a large blackboard available. This will enable demonstration at the time a problem or need arises. The void between lecturing and doing is sometimes filled by illustrative drawing. Developing the technique of drawing is a studious and time-consuming task, but when utilized effectively it decorates the art of teaching. The first year preparatory courses for Crown and Bridge and Operative involve the explanation of such things as morphology of the tooth, embrasure and contact form, functional interrelationship, waxing, casting and polishing technic, and a multitude of other laboratory procedures. The explanation and interpretation of these procedures is most effective when accompanied by demonstration at the blackboard and supplemented by other visual aids.

Develop a Visual Aid Library

As explained previously the teaching methods in courses in Crown and Bridge require visual interpretation. The preparation and collection of visual aids is a time-consuming and expensive operation. If the accumulation of these materials is gradual and systematic the cost and time is distributed over a relatively longer period.

The preparation of visual aids in our department is a principal administrative objective. Each instructor is encouraged to make a contribution each year. A student assistant is assigned to the department to assist in this work. Film and slide lists have been compiled. Photographs, slides and models of practical cases are being accumulated. Charts and graphs are being prepared. The entire procedure of developing a visual aid library is a continuous one.

Use the Discussion Technique Where Indicated

The discussion technique has been useful in Crown and Bridge preparatory courses during the introduction of a new procedure, to re-activate interest, to discuss student problems at specific stages, to institute a "break" during certain technics, and to encourage "drive" performance. Long and numerous laboratory procedures involving detailed precision and repetition of similar exercises can introduce the factors of monotony, decreasing interest and efficiency and a slower learning curve. The discussion technique is used to a great extent to correct these problems.

For example, when we introduce the student to the study of occlusion he is required to mount and function a set of stock typodonts on an articulator. Mere explanation of this technic is insufficient. Stock typodonts contain manufacturing imperfections and require adjustment in the teaching plan. When these arise they are discussed with the students in groups and a solution is agreed upon. The beginning student cannot comprehend the specific requirements of an adequately functioned set of typodonts. The method of spot-grinding typodonts is discussed during various stages of completion. Each articulator presents an individual problem which of necessity requires individual discussion.

Consider Selective Assignment as a Specific Teaching Aid

During the introduction of a new technic the assignment of one instructor to a definite group has considerable advantages. It places the responsibility for development of the student with a specific instructor, and enables more concentrated supervision of each student. It also encourages more energetic activity from both parties. The problem of the student that moves from instructor to instructor to seek aid during the introduction of a new technic and the student that never solicits instruction causes an inequitable distribution of teaching effort. The selective assignment technique can overcome some of these problems.

High standards of performance and a limited time for completion of requirements results in the division of students into various categories of achievement. At certain stages the "slow" students are isolated and instruction is concentrated on this group until all members achieve the assigned requirements. Below average students also receive the benefit of selective teaching. Students who have been ill and have been absent from classes or students who have make-up requirements to complete are also treated in the same manner. The question then arises,—"Do the inferior, slow, and make-up students receive all the selective assignment?" The answer, of course, is "no." The above average student likewise is the target of selective instruction.

Selective assignment involves the use of a detailed accurate classification system. Our classification is based upon two factors; first, performance of technical exercises, and second, performance of practical examinations. Technical exercises are accomplished with the aid, supervision and assistance of instructors and are teaching media only. Practical examinations are conducted in accordance with standard examination procedure and give evidence of the student's true innate ability. Problems arising from each of these categories are treated differently.

The instructors assigned to the slow or below average student are required to fill out the "Instructors Report" which consists of a complete analysis of the factors relevant to the student's technical performance and a listing of instructional aids that should be offered. The "Instructors Report," therefore, acts as a guide for observation and instruction.

Try the Personal Interview Method

The personal interview method has been a very effective administrative and teaching aid for the first year dental laboratory courses. It offers an excellent opportunity to become familiar with the student and his problems both academic and personal. The first interview is held previous to the close of the first midterm period after the student has finished his first practical examination and several technic pieces. The results of the examination are discussed at length. Similar personal interviews are held after each subsequent practical examination, and

this has been the method of choice of consultation regarding the examination results. Previously, the student was informed of his results by typed analysis. Later, the results were recorded on a wire recorder and relayed to the student by playback. Both of these methods proved inadequate for our purposes. The posted grade has also left voids in our teaching plan. It did not provide the student with sufficient information concerning our evaluation. The personal interview enables a visual interpretation of technical exercises and is particularly suitable to evaluation of laboratory results. It is extremely difficult to explain examination results by posted grade or typed paper. A visual examination is mandatory. The effectiveness of this method is appraised by the reaction of both student and instructor.

ENCOURAGE THE DEVELOPMENT OF INTERESTS AND INCENTIVES

Our most difficult teaching problem is to cause students to desire to achieve exactness and perfection in technical performance. As previously stated, an incentive of achieving perfection is established at the beginning of instruction. Teaching to the ideal is followed throughout the course. Perfection is the by-word of our teaching. This introduces a conflict between a teaching goal, student incentive and the inability of the great majority to achieve the objective. A serious attempt is made to drive the student to better and better performance. The establishment and maintenance of improvement incentive requires continuous study and application.

We are constantly faced with the problem of stimulating the interest of the average or below-average student. We have discovered that the disgruntled or complaining student is usually a member of this group, and for this reason we are constantly attempting to create and maintain his incentive.

STRESS THE IMPORTANCE OF TRANSFER IN LEARNING

The courses in Dental Morphology and Applied Dental Anatomy must be related to each other, to subsequent courses in Crown and Bridge and to the curriculum as a whole. We attempt to show the relationship between model teeth and extracted teeth, between the carved individual tooth and the tooth in functional interrelation, between the carved isolated tooth and Crown and Bridge and the overall importance of including satisfactory anatomical form in all restorations. The relationship between the teachings of these first year preparatory courses to advanced courses in Crown and Bridge, Prosthetics, Operative, Surgery, Periodontia and Orthodontia is stressed.

DEVELOP THE GIFTED STUDENT

An exercise designed to test precisional ability is included in the course. This exercise requires time-consuming application, attention to minute perfection and a desire to achieve exactness. This exercise, practical examinations and general technical performance enable the discovery of the gifted student. The results of his performance become known to him. He is informed of his potential during the interview and encouraged to perform to the full extent of his ability. This procedure has not resulted in overconfidence, conceit or a let down in production. On the other hand we have discovered that the student will work harder and with increasing interest.

STUDY THE IMPORTANCE OF MENTAL-MANUAL COORDINATION

The learning process relative to performance of technical skills deals with the study of mental-manual coordination. An individual is presumed to possess a

certain degree of mental ability and this fact has been ascertained in educational circles for many years. The literature cites the fact that manual dexterity is a part of the individual's makeup in various degrees of effectiveness. Didactics deals primarily with mental ability in theoretical courses but not exclusively with manual dexterity in laboratory courses as has frequently been the claim. The theory is advanced that the process of mental-manual coordination is prevalent during the performance of laboratory exercises in the field of dental science. Innate mental or manual ability is possessed alone or in combination. We cannot treat manual ability as the only factor that influences technical performance. The influence of mental ability on the performance of manual skills cannot be regarded lightly. This does not infer that a physiological limit to the learning of technical skills does not exist, but does imply that manual ability can be influenced by mental direction. Teachers in the field of dental science in their attempt to increase technical performance should devote some time to the observation and study of the whole problem of mental-manual coordination.

Evaluation

As explained previously the laboratory work in the courses in Dental Morphology and Applied Dental Anatomy is divided into two categories; practical examinations and technical exercises.

Technical Exercises

The students must achieve a minimum standard in technical exercises. Substandard technic is graded "incomplete" and returned to the student, who must correct it and continue to improve it until the standard is achieved. Satisfactory technic is graded and the student is informed of his results. The grades attached to technical exercises are for the student's information only and do not influence the final course grade. The reason for such evaluation is that all possible teaching influence is exerted toward student learning and practice in technical exercises. Too many factors other than individual ability influence the final result. For example, an instructor may devote considerable time correcting the anatomical form of a carved tooth in order to demonstrate the desired objective. A poorly carved tooth by the student may be improved to a point of perfection by the instructor. Thus, technical exercises should be teaching and learning exercises, rather than tests of performance and ability.

Practical Examination

These examinations are conducted under strict test conditions. No teaching influence is provided. The student is examined only on work that he has accomplished during the teaching periods. The student is informed of the results of his examination individually so that each member of the class is not aware of the other members grades. This method tends to reduce the factors of embarrassment and classification by other students. As explained previously, the student is accorded a personal interview to discuss examination results.

Staff Administraton

There are five instructors and one student assistant assigned to our courses. Acquiring instructors in the field of precisional dentistry who

can do excellent and beautiful work and also are qualified as teachers is a problem of paramount importance. Students constantly request assistance and demonstration and therefore are able to see the instructors perform. They become aware of the instructor's ability and utilize that ability to their specific advantage.

Participation in teaching warrants participation in evaluation. The grading and evaluation of technical exercises and practical examinations by all instructors increases interest in teaching. The students must know that all instructors participate in grading; thus they will solicit assistance from all instructors rather than just those that evaluate performance.

Special responsibilities are assigned to each instructor. These include such things as participation in lecturing, demonstrating, preparing models, conducting interviews, preparing visual aids, recording grades, and completing special reports. Each instructor is encouraged to develop material for presentation at dental society meetings. Interest in dental society, committee and administrative work is stimulated. A new plan for development of research projects within the division has been set up.

One of the most effective devices for the development of new instructors is our student assistant training program. A promising junior student is selected to become a member of our staff each year. He does not have any teaching responsibilities until the last half of his senior year, but performs many routine functions pertinent to the operation of the division. In this way he becomes acquainted with the course and its teaching and administrative procedures. During the last half of his senior year he is permitted to assist in instruction. After graduation he is invited to become a permanent member of the staff.

Summary

The purpose of this presentation has been to direct attention to the course organization and teaching procedures used at the University of California in the preparation of the first year dental student for the study of Crown and Bridge Prosthesis. No attempt has been made to suggest that these methods and procedures should be standard for all dental schools. It is recognized that the conditions and circumstances at each school are different, and that the approach to curriculum problems will likewise vary.

It is hoped that the method discussed in this paper will result in a critical evaluation and a constructive analysis of our procedures with the ultimate objective being the development of superior techniques that can be used in the approach to a common education problem.

THE ORIENTATION OF DENTAL STUDENTS TO CLINICAL ORAL SURGERY[1]

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The present paper is not presented with any assumption that the procedures outlined represent perfection, or that the routines indicated necessarily call for widespread adoption. It is presented rather as part of our basis of discussion, and represents a single and individual approach to a rather complex problem. It is the outline of a system that has imperfections, some of which are known to us, and others which today's discussion will probably reveal.

Our first step in introducing students to the clinical practice of oral surgery occurs during the first year as part of their course in orientation. Our department gives them two hours in orientation at that time, the first hour being spent in generalizations with the whole class, and the second hour is spent in the department of oral surgery in groups of eight. At that time we attempt to demonstrate and impress on the students the application of the basic sciences to surgical practice. We stress the fact that anatomy, physiology and pathology are the foundation stones of surgery, and try to present patients with ailments which permit us to drive the various points home. We try to impress on the student's mind the basis of the dental curriculum and why he is under the necessity of studying the various subjects. Direct applications are made to the patients at hand, and we point out to the student that we expect him to come to the department in three years time with sufficient background to intelligently diagnose and treat surgical patients. We have found it particularly effective to show a patient with an oral tumor of some kind, and follow this by viewing the microscopic slide and reading the pathological report of the biopsy. Of recent years we have kept a microscope in the department and have a slide sent to us with each of our pathological reports. This has been a most effective teaching aid, as histology and pathology are much more real and purposeful to the student when he is using them for the benefit of his own patient. Through pointing out the lesion and describing the follow-up to our first-year students we hope to impress them with the desirability of being adequately equipped in the fundamentals.

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[1]Read before the American Association of Dental Schools, Oral Surgery Section, Colorado Springs, March, 1952.

[2]Professor and Head of the Department of Oral Surgery and Anaesthesia Faculty of Dentistry, University of Toronto.

It is also advantageous for members of the staff of the oral surgery department to be associated, through teaching assignments, with the various basic science departments. At the moment we have such an arrangement with the department of pharmacology, and there is dental representation in the departments of bacteriology, physiology and pathology. We are hopeful that we can establish a similar relationship with the department of anatomy in the very near future.

Our students start their training in surgery with an elementary didactic course in their second year, but have no contact with clinical patients at that time. They receive most of their instruction in their junior year, which consists of lectures, clinical demonstrations to small groups in oral surgery and local and general anaesthesia. These, in turn, are followed by clinical practice.

By the end of the first term of the junior year our students have had instruction in the basic principles of tooth removal and the lectures in local and general anaesthesia are completed. From the start of their junior year the students are divided into groups of approximately eight, and each group is then given seven one-and-one-half hour clinical demonstrations on the seven things that we consider most fundamental to them in clinical practice. The sequence and content of these clinics is as follows:

General routine of the department, including asepsis, scrubbing, history taking, charts, etc.
Instruments and instrumentation.
Infiltration anaesthesia, tuberosity and infra-orbital injections, and extraction of maxillary teeth.
Mandibular anaesthesia and the extraction of mandibular teeth.
Muco-periosteal flaps and suturing.
Immediate insertion of dentures.
Root resection.

It is repetitious, laborious, and time consuming for the staff to repeat the above seven group clinics for groups of the size indicated, but although we have only been giving these clinics for the last three years, we have found it to be time very well spent. It has proven to be our most effective form of teaching and to fully justify the effort involved. It has been our experience that students absorb and retain the instruction given in these clinics to a degree that we have found unattainable by any other method. Motion picture films and slide instruction to the entire class are valuable, but we have found them to be a poor substitute for clinical demonstrations to small groups.

The over-all method by which we try to introduce the student to clinical practice in oral surgery actually involves three steps. We first

tell them what to do in lectures; we next show them how to do it by means of clinical demonstrations, after which they go on to the third step, which consists of observing and assisting the senior students during operations. At the conclusion of their observation period they are given their first clinical assignments in the department of oral surgery.

Our department consists of but four chairs, one of which is used for the clinical demonstrations previously noted, so that but three senior students per day are assigned to the department. As soon as the junior student has received his seven clinical demonstrations he is assigned to surgery to observe and assist the senior students.

At the end of the junior student's observation assignments the senior assignments are reduced to two, and one junior student is assigned in place of the senior that has been dropped. Later still we assign two juniors and one senior and as the end of the year approaches and the senior students are preparing for their examinations, we assign three junior students to assume responsibility for the clinic.

We have found the practice of assigning but one junior student at the start to be very helpful, and care should be taken at first to select cases for him that are well within his capabilities. Every effort should be made at this time to help the student to build up his own confidence. If he gets into difficulty we have often found it beneficial to arrange for a senior student to help him out of his difficulty. It is good experience for the senior, puts him on his mettle, and if he has considerable difficulty in completing the case it helps to build up the morale of the junior, who will think much better of his own ability after seeing the troubles of a senior undergraduate.

In my opinion it is vital that the instructors in oral surgery should be expert teachers, more so than in any other phase of dentistry, because nowhere else can a student be "made" or "broken" so readily. A nervous, hypertensive student may lose all confidence in himself through careless teaching, while the same student, when handled with care and understanding may be built up into one of the most skillful and confident members of the class. If the oral surgery staff is chosen without regard to anything but operating ability the results may be disappointing. A thorough understanding of the students' mind and temperament is an absolute necessity if maximum teaching benefit is to be achieved.

The writer has developed as a dental teacher without any organized training in the field of pedagogy, but experience soon taught him that different students require distinctly different methods of approach. They may be roughly grouped into normal or average students, timid students,

lazy students and rough and over-confident students. Average students and lazy students may usually be handled in a rather routine way. The other two categories, however, require much more careful handling.

The first consideration in regard to the timid student should be to see that his first introduction to surgery should be a case that is well within his range of accomplishment. If this type of student encounters difficulty, even though the case itself is simple, it is often wise to take time to explain the difficulties of the case to him, and to show him the method of choice for completing the case. If the instructor brings the case along in this way to the point where there is no possible doubt of the student's ability to complete it, and then allows him to do so, it is much better teaching than for the teacher to brusquely take over the case himself and deliver the tooth with a flourish.

The latter approach, particularly when used repeatedly on the same student, may cause him to lose all confidence in himself and his operative ability, even to the point where he begins to think of abandoning the course. However, if the same student's confidence is built up by a series of carefully planned steps his operative ability increases in direct ratio. I am reminded of one of our own students who last fall was one of our most timid and nervous students, yet today he is one of the better students, and is a confident, careful and competent operator. We have found it to be a very distinct advantage for the students to perform their first extractions on simple teeth with the patient under a general anaesthetic, but unfortunately it is only possible for us to start a very small percentage of them in this way. However, it is a method that works well for highly strung students.

The rough and over-confident type of student is not as common as the types already mentioned, but they are always a problem in post-graduate groups. They have always presented our most difficult problem, and one that we have been unable to solve in some instances. Once the instructor's back is turned they revert to type, and following graduation their judgment does not always increase with years of practice. Suggestions for handling this type of student would be gratefully accepted.

Orientation of students to clinical oral surgery requires judgment, good management and tact, and the success of the teaching program will be directly proportional to the competence of the staff in the field of student psychology.

DEGREE JURISDICTION IN DENTAL SCHOOLS

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The following paper, "Degree Jurisdiction in Dental Schools," is one possibly requiring consideration by those schools located at a distance from the parent institution, and in that thought is herewith submitted. (Ed.)

The University of Oregon faces difficult problems because its dental school and medical school are more than 100 miles from the main campus. This distance sometimes may show itself in divergent philosophies as well as in geography. Solutions at other schools were sought through a questionnaire, sent to all accredited dental schools (and medical schools) with affiliated parent pre-professional institutions. The replies were analyzed for general relationships, and also for unique relationships under the special conditions of geographical remoteness. Returns (sometimes incomplete) from 37 dental schools amounted to 95 per cent of those questioned, and the demonstrated care in replying gives confidence to our conclusions.

Our questionnaire was introduced to each dean of a dental school with these sentences: "We are asking the deans of dental schools and of medical schools for information and advice, in exploring the academic area where pre-professional and professional schooling meet and overlap (and sometimes conflict). We need to know your current practices in specified situations, and we will appreciate any supplementary comments you may give us. We have reduced our questions to alternatives which you may check, from your store of knowledge and experience. The first questions concern your school's professional degrees; the later questions concern the relationships of your professional work to baccalaureate degrees. (We might add that we have discussed these problems and this questionnaire with Dr. Francis R. Manlove, associate secretary of the American Medical Association's Council on Medical Education and Hospitals, and with Dr. Shailer Peterson, secretary of the Council on Dental Education of the American Dental Association.)"

The 16 questions posed in the questionnaire touch on the machinery affecting professional degrees, as a comparison for the machinery affecting baccalaureate degrees, and on the details of applying professional-school credits toward the baccalaureate degree. The questions are listed separately below with data and comments on each in turn.

1. Are your professional degrees (M.D., D.D.S., etc.) granted by and

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in the name of: (a) your professional school; (b) your parent institution.

The reply was unequivocally "parent institution" in 35 schools; one school replied that professional degrees are granted jointly, and one school reported that they are granted by the dental school itself. This last is one of the eight dental schools located fifty miles or more from their parent universities.

2. Are candidates for your professional degrees cleared by or through: (a) your professional-school faculty; (b) your professional-school dean; (c) the general faculty of your parent institution; (d) other authority.

The approval of candidates for professional degrees involves the dental school faculty in all but one institution: in 23 schools the dental school faculty alone, in nine schools the dental school faculty and dean, in two schools the dental school faculty and dean and the general university faculty, and in two schools only the two faculties. There is one institution where these degrees are approved by the general university faculty alone. (It is understood that in most schools a formal final approval comes from a governing board.)

3. What signatures are on the diplomas for your professional degrees: (a) dean of professional school; (b) president of parent institution; (c) Chairman of Board of Trustees; (d) others.

Practices on diploma signatures vary widely in details, from the two dental schools whose professional diplomas bear only one name (president of the university) to the one school with signatures of the dental school dean, the president of the university, the chairman of the council, the vice chancellor, and the secretary. (At two new dental schools the signatures have not yet been decided.) The university president signs the professional diploma for all 35 dental schools, the dental school dean signs in 26 schools, a representative or representatives of the governing board signs at 14 schools. Others include the secretary of the university at five schools, the registrar at two schools, the treasurer at one school. In one state the governor signs the dental school's professional-degree diplomas.

4. Are proposed changes in your professional curricula cleared by or through: (a) your professional-school faculty; (b) your professional-school dean; (c) the general faculty of your parent institution; (d) other authority.

The professional curriculum is mainly the responsibility of the dental school itself. Changes in it are cleared in 19 schools by the dental school faculty, in three schools by the dental school dean, in nine schools by them jointly, and in five schools by one or both of them together with the university faculty or senate or curriculum committee. In the case of one dental school changes in professional curricula are cleared by the general faculty of the parent university.

5. Are commencement exercises for conferring your professional degrees held: (a) as part of the general commencement of your parent institution; (b) separately, but at your parent institution; (c) separately, in the professional school.

Commencement exercises are the single element which is clearly differentiated

according to the distance between dental school and parent university. All 29 of the dental schools located on or within 50 miles of the university campus share in the general commencement exercises of the institution; six of the eight "remote" dental schools conduct separate commencement exercises, at the dental school.

6. Do you require a baccalaureate degree before conferring your professional degree: (a) yes; (b) no.

No dental school requires a baccalaureate degree before conferring the professional degree.

7. Are baccalaureate degrees granted, to those of your professional students who entered without them, by: (a) your professional school; (b) your parent institution; (c) the various pre-professional institutions from which students came.

Dental schools are not much concerned where or whether or how their students obtain baccalaureate degrees. Only one dental school itself confers such degrees (it is one of the eight dental schools "remote" from the main campus).

8. Are candidates for your institution's baccalaureate degrees, among your professional students, cleared by or through: (a) your professional-school faculty; (b) your professional-school dean; (c) the general faculty of your parent institution; (d) the Liberal Arts Faculty of your parent institution; (e) the Liberal Arts Dean of your parent institution; (f) a department of Liberal Arts; please specify all which are so used, approximately in decreasing order of frequency; (g) a cooperating professional-Liberal Arts authority; please specify under which officials and under what designation; (h) other authority.

Similarly the authority for clearing baccalaureate degree requirements is primarily in the hands of the parent university. In 16 institutions this is done entirely within liberal arts, in one by the general university faculty; in eight institutions it is shared by liberal arts and the dental school as such, while in one school it is done by a "committee on the integrated program in liberal arts and dentistry." In only three institutions does the dental school clear baccalaureate degree requirements, in one of these only for the degree Bachelor of Science in Dentistry.

9. What signatures are on the diplomas for these baccalaureate degrees: (a) dean of professional school; (b) dean of Liberal Arts of parent institution; (c) department head of Liberal Arts in parent institution; (d) President of parent institution; (e) Chairman of Board of Trustees; (f) others.

The university president signs baccalaureate degree diplomas at all 27 institutions answering this question. There also are signatures for liberal arts at 15 and for the governing board at 20 institutions. Only one dental school dean signs baccalaureate diplomas.

10. Are baccalaureate degrees for your professional students desig-

nated any or all: (a) Bachelor of Arts; (b) Bachelor of Science; (c) Bachelor of _____; please specify; (d) Bachelor of Science in _____.

Either or both the Bachelor of Arts and the Bachelor of Science degrees are available in most of these schools. Only 3 schools offer only a Bachelor of Science in Dentistry, although this is given in addition to the B.A. or B.S. in two other schools (two of these five are among the six "remote" dental schools answering this question).

11. Are baccalaureate majors for your professional students designated any or all: (a) Biological Science or Sciences; (b) Biology; (c) Chemistry; (d) Dental Science or Sciences; (e) Dentistry; (f) General Science or Sciences; (g) Medical Science or Sciences; (h) Medicine; (i) Natural Science or Sciences; (j) Zoology; (k) others.

Generally the major for these baccalaureate degrees is in a liberal arts department, without reference to the dental school. But at seven schools it was Dentistry, at two Dental Science, at one the Scientific Dental Program (four of these ten are among the five "remote" dental schools answering this question).

12. Are baccalaureate degree requirements for your professional students, in terms of courses designed for general education: (a) the same as for Liberal Arts majors taking the same degree in your parent institution; (b) less completely specified than for purely Liberal Arts majors.

Generally (a ratio of over four to one) baccalaureate degree candidates in the dental school must meet the same requirements as those qualifying in the same major in the main university.

13. How much credit for work in your professional school is allowed toward the baccalaureate degree for your professional students: (a) one year maximum; (b) two years maximum; (c) one year beyond "basic science" courses in professional school; (d) other.

In a strong majority of institutions only one year of dental school credit may be applied toward a baccalaureate degree; in one school this is a year beyond the "basic science" courses. Three schools allow none, one school only one-half year's credit. Five institutions accept two years, in some cases toward only the B.S. in Dentistry; one of these schools will reduce its allowance from two to one year, effective next year.

14. Is this credit applied toward baccalaureate degree requirements as: (a) lump or total credit only; (b) allocated to science departments and counted toward departmental totals; (c) substitute for other requirements.

In about three-fourths of the institutions this credit is accepted in total only, not applied to specific subject matter requirements (four of the eight schools where it is allocated in detail are among the six "remote" schools answering this question).

15. Are baccalaureate degree requirements for your professional students identical for those with all pre-professional work at your parent institution, and for those with part or all of their pre-professional work at another institution: (a) yes; (b) no.

In all but one of these institutions the requirements are identical for the groups mentioned.

16. Are exceptions to baccalaureate degree requirements for your professional students considered and decided by: (a) your professional-school dean; (b) faculty adviser in your professional school; (c) faculty committee in your professional school; (d) committee or official of the related Liberal Arts faculty; (e) committee or official of the general faculty of your parent institution; (f) other.

The replies to this question again clearly state the essential conclusion that dental schools are little concerned or involved with baccalaureate degrees, even for candidates who are enrolled in the dental school.

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"One of the most durable satisfactions of life is to lose oneself in ones work."

—Harry Emerson Fosdick.

PERIODONTIA

A Conference session and panel discussion, including a short, concise statement relating to the biologic aspect in teaching and a Summary of the proceedings. The manner of presentation, both in speech and in print is unique. (Ed.)

TEACHING A BIOLOGIC VIEW IN PERIODONTAL PATHOLOGY

(A Greatly Condensed Statement)

MILTON B. ENGEL, D.D.S.,[1] *Chicago*

The periodontal tissues are largely of connective tissue origin. The extracellular ground substance of connective tissue contains an aggregrated carboyhdrate-protein complex which is very labile in a biologic sense. The physical and chemical states of the ground substance vary with physiologic and pathologic states. In this way endocrine changes, local irritation or the interaction of these can cause alterations in the periodontal structures. A departure from the normal state, caused by a systemic factor may not be clinically evident until local factors are superimposed. Local treatment might return the tissue to apparent health leaving the underlying abnormality in the connective tissue uncorrected.

It is implicit in this view that an understanding of the basis of cellular activity and of the biology of connective tissue should be among the first objectives in the teaching of periodontia.

THE OBJECTIVES OF THE TEACHING PROGRAM IN PERIODONTIA[2]

(A Panel Discussion)

Willard C. Fleming, D.D.S., University of California, San Francisco, *Moderator.*
H. G. Ray, D.D.S., University of California, San Francisco.
E. F. Allen, D.D.S., Washington University, St. Louis.
H. W. Swensen, D.D.S., University of Indiana, Indianapolis.
Wm. G. Schafer, D.D.S., University of Indiana, Indianapolis.
J. F. Jacobs, D.D.S., Kansas City, Mo.

(The discussion followed the attached outline diagram as designed by Dr. Fleming and the summary follows as prepared by B. O. A. Thomas under the title: "Where Do We Go from Here?")

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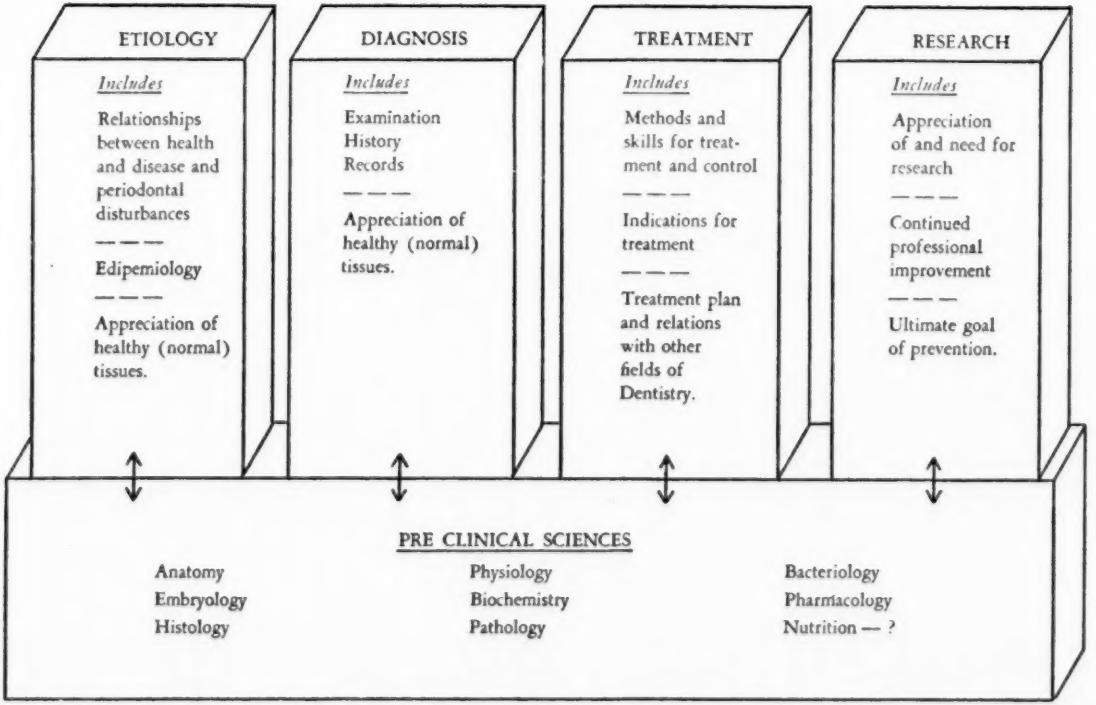
[1]College of Dentistry, University of Illinois.

[2]Presented at the Annual Meeting of the Section on Periodontia, American Association of Dental Schools, Colorado Springs, March, 1952.

OBJECTIVES OF A TEACHING PROGRAM IN PERIODONTICS



SUMMARY: "WHERE DO WE GO FROM HERE?"

B. O. A. THOMAS, D.D.S.,[a] *Seattle*

In attempting to decide where we go from here, it is important to know where we have been and where we are at the present time. It is hoped that on the basis of today's discussion we shall have a clearer idea of past accomplishments and present-day ideas and activities. Further analyses of this information will, we feel, enable us to prepare the material for next year's periodontia program at a general session of the A.A.D.S.

Dr. Allen emphasized that we must give the students *fundamental* principles which can be applied to clinical problems. He also reminded us that good teaching requires that we keep in mind the *individual variation* in the students—we cannot teach them *all* in exactly the same manner. Dr. Allen believes we should, within reason, encourage our students to "experiment" on cases they are treating. He pointed out that if progress is to be made ("The best is yet to come"), it will be through the graduates of our schools, and they must be stimulated to further study and research by our influence. He mentioned the value of stimulating the student by such means as special assignments, student research projects, journal clubs, contests, prizes, etc.

Dr. Jacobs pointed out that periodontia is a most important field for the clinical application of basic science knowledge. For this reason our periodontia teachers must be well trained in the basic sciences. He stressed the need for *motivating* the student, and described biomechanical devices and visual aids for achieving such motivation. Dr. Jacobs also stated that oral diagnosis is the connecting link between preclinical and clinical phases of periodontia.

Dr. Schafer emphasized, as did other speakers, that normal conditions must be stressed in order for the students to understand pathologic conditions with which they are confronted. Students should be given credit for biopsy procedures which they carry through to completion in the laboratory. Good rapport between the hospital and the dental clinic is very important in adequate teaching of pathology.

Dr. Swensen explained the use of visual aids in emphasizing normal and pathologic conditions. The application of knowledge thus gained in charting and diagnosis was described. He stressed the need for interdepartmental cooperation in the matter of thorough diagnosis and treatment planning.

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[a]School of Dentistry, University of Washington.

Dr. Ray explained the importance of telling the student *why* as well as *how* to apply his technical skills. He feels that the place to teach applications of the basic sciences is *at the dental chair*. By constantly stressing the normal conditions, abnormalities become more readily apparent. Dr. Ray believes that most effective teaching of periodontia during the second and third years can be done by *group instruction*, with each instructor having ten students in his charge. Effective also are seminars and demonstrations, with both teachers and students present. Students should gradually be assigned more difficult cases as they demonstrate their ability in the field. Students should definitely see their treated cases for recall visits, in order to evaluate treatment results. He believes senior students should have *"special assignment"* cases, which are carried through treatment under *one* instructor.

A very lively discussion followed the presentations by the panel members. Out of this discussion the following comments were gleaned:

Basic sciences are merely a means to an end—the end being more intelligent handling of clinical treatment. This problem of applying basic science knowledge is *not* a new one.

Dr. Ramsfjord of Michigan asked that we "Remember the teeth" in this problem, and not get too far afield. By *applying our present knowledge* we can prevent much periodontal disease and can successfully treat the majority of cases which do develop. By local treatment he believes we have our best chance of controlling periodontal disease. He added that we very much need more "system" in applying our technical skills in periodontia.

Dr. Hine believes that our basic sciences must be *slanted* toward clinical dentistry by the teachers in basic science subjects or the students will not carry this basic knowledge into their clinical experience. This point was discussed at some length.

Dr. Swensen stated that periodontal diagnosis must be taught in periodontia in addition to what is taught in oral diagnosis.

Dr. Mowry feels that we are tending towards excessive departmentalization in dental schools. Oral diagnosis *should*, he believes, look at the *entire mouth*, and there need only be certain limited repetition by the various special branches of dentistry.

Dr. Engel again stressed the great importance of the connective tissue and its ground substance in the development of periodontal diseases. He reminded us that this tissue is constantly changing during health and disease. Dr. Engel stated that anyone who believes in the efficacy of

oxygen therapy in the treatment of periodontal disease does not understand the physiology and biochemistry of cellular reactions.

Considerable discussion centered around the question of systemic factors in periodontal disease. The questions of total health, and nutritional deficiencies and their detection by the dentist were discussed by several people, including Drs. Lyons, Mowry, Ramsfjord, Engel, Henry, etc.

Dr. Lynch (Creighton University) said that he felt it isn't what you could "teach" or *pound into* a student that is important, but what you can *get out of* him. There must be a *desire* by the student to learn.

In the teaching of periodontia, the *technics of treatment* should be the *last thing* taught. The underlying principles should be understood thoroughly then the treatment itself falls naturally into line.

Finally, it was agreed that what we are really striving to teach is *clinical judgment.*

Following his summary of the above material, Dr. Thomas presented in abbreviated form on lantern slides, the analysis of the returns from a recent questionnaire pertaining to certain phases of present-day teaching in periodontia.

"No one is useless in this world who lightens the burden of it for someone else."

—CHARLES DICKENS.

FULL DENTURE PROSTHESIS

A SYMPOSIUM[1]

GEORGE A. BUCKLEY, D.D.S.,[2] *New York*, Moderator

The Curriculum Survey Committee made a study in 1935, and published a report which contained recommendations for a course of study in dentistry, including, of course, full denture prosthesis. More than 15 years have elapsed since that time and many changes have taken place in this field. In the light of these changes it may be worthwhile to review the committee's objectives and recommendations.

The question "What knowledge, technical ability and experience do you regard as essential for the graduating dental student in full denture prosthesis" was answered by each panelist.

During the discussion it was pointed out that the teaching of denture prosthesis is suffering badly because of lack of time allotted to this subject. It seems that time for each new course added to the curriculum is taken from this department. Prosthodontists feel that it has gone beyond the point where they have sufficient time for adequate instruction. No resolutions were offered nor dicisions definitely reached. Two papers were submitted, which appear herewith.

WHAT KNOWLEDGE, TECHNICAL ABILITY AND EXPERIENCE ARE ESSENTIAL TO THE GRADUATING DENTAL STUDENT IN COMPLETE DENTURE PROSTHESIS?[3]

CARL O. BOUCHER, D.D.S.,[4] *Columbus*

What knowledge, technical ability, and experience are essential to the graduating dental student in complete denture prosthesis? The answer to this question is quite simple. The graduating dental student should have sufficient knowledge, technical ability, and experience to practice satisfactory prosthetics in a general practice of dentistry. He should know what to do, when to do it, how to do it, why he does it, and above all, he should be able to do it.

When a dental student graduates and is licensed to practice, he is equal, in the eyes of the law and of the public, to any other dentist.

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[1]Held on Wednesday, March 26, 1952, Colorado Springs. The panel consisted of three panelists, one of whom, Dr. Jack Werner, spoke with the aid of a film. No paper being prepared.

[2]Department of Denture Prosthesis, New York University.

[3]Presented before the American Association of Dental Schools, Dental Prosthesis Section, Colorado Springs, March, 1952.

[4]Professor, Denture Prosthesis, College of Dentistry, The Ohio State University.

This includes the dental teacher and the State Board examiner. So, it might be wise to reflect a moment about what this means to the public.

What does the patient expect when he goes to the dentist for prosthetic service? He expects restorations that will restore his appearance, be comfortable, and restore his ability to eat and speak efficiently. He is not in the least interested in whether the dentist knows which muscles flex the arm, or whether he knows the innervation of the muscles of the foot. He certainly would not go to the dentist to have his appendix removed. The patient could, however, expect the dentist to know the anatomic foundation for his dentures, the anatomy and physiology of the temporomandibular joint, and the physiology of mastication. He would expect the dentist to know how to build satisfactory dentures for him, and how to handle the materials that go into the dentures. That means that the young dentist must know how to plan the dentures, and how to make them, and how to care for them. He should be skillful enough to render the service the patient expects.

We might ask ourselves, "Why do students get a dental education?" It is for one or more of three reasons. They may spend several years in training for the practice of dentistry, or for a career in dental teaching, or for research. The public is willing to pay for dental service which includes all of the operations which will save or restore their teeth. The training for dental teaching or dental research must be predicated upon knowledge and ability to practice dentistry. This training should be built upon the basic education in dentistry. Unfortunately, the present trend seems to be away from a practical education in dentistry. There seems to be an unwarranted jealousy of the physician among some dental educators. There seems to be a feeling that it is beneath the dignity of a dental student or a dentist to do things with his hands. Some would have us train pseudo-physicians rather than dentists. This attitude is wrong. Dental service is a skill based upon a knowledge of many anatomic, histologic, physiologic and pathologic facts. But it is a skill, nevertheless. Please do not misunderstand me. I do not belittle the fundamental sciences. I feel that the science of dental restorations must be taught on a foundation of basic science. But, I do feel that it is time to take stock of the basic sciences and see that they teach the facts that are of value to dentists. Knowledge of science for its own sake is not enough.

It takes time to acquire skill in any operation. It is not sufficient for a student to do an operation once, in order to gain skill in that operation. (I made a hole in one back in 1945, but I haven't made one since. One perfect shot did not make a good golfer out of me. I still need about

90 strokes in 18 holes.) It is a different matter to know how to do a thing, and be able to do it. "Book-learning" will never produce good dentures. Experience and repetition will develop skill, which can produce good dentures when this experience is built upon a background of fundamental knowledge of prosthesis.

A survey of clinical achievement by Charles W. Craig,[3] shows 6.15 as the average number of complete dentures made by students graduating from the dental schools of the United States and Canada. The average number of other restorations placed were: gold foils, 17.91; gold inlays, 21.97; amalgams, 55.58; silicates, 18.57. Where is the logic that says a student must make 55.58 amalgams and 6.15 dentures? Are amalgams that much more difficult than dentures?

The problem of providing this fundamental knowledge and sufficient experience to develop skill is becoming increasingly more difficult to solve. For years the cry has been, "More time is usually devoted to instruction in dental prosthesis than to any other subject in the dental curriculum." (Incidentally, that statement appears on page 269 of the report of the Curriculum Survey Committee[4] of this association, published in 1935. The committee failed, however, to make it clear that this includes three subjects: crowns and fixed partial dentures, removable partial dentures, and complete dentures.)

The result of this is that whenever more time is desired for basic science courses, or when new courses are to be added, the time is taken from prosthesis. Or, they simply add other courses which automatically reduce the amount of time available for prosthesis. For example, in one school, in 1927, 69 courses were included in the dental curriculum. In 1937, after the publication of the Curriculum Survey Report, this school had 78 required courses, and in 1952, there were 97 courses in the curriculum. During this period there was a streamlining of the preclinical technical requirements and a reduction of laboratory hours to the point where the student cannot complete these exercises in his regular class periods. This situation is general and can be verified by a glance at the bulletins of the various dental colleges. Where is there a dental fraternity without its busy laboratory? Is this work, done after hours, without instruction, dental teaching which fits the graduate to practice the kind of dentistry the public has a right to expect? Would it be any more illogical to have our students do their physiology or bio-chemistry experiments at home?

There is one other factor in the teaching of complete denture prosthesis

[3]*Journal of Dental Education*, 16, 7, 1952 (Jan.).

[4]Blauch, L. E.: A Course of Study in Dentistry, *American Association of Dental Schools*, 1935, p. 269.

that is worthy of consideration here. The commercial dental laboratory is established as an integral part of dental practice. Most of the technicians in dental laboratories have not been educated to understand the complexities of the dentist's problems in complete denture service. They have learned second hand. Therefore, if we recognize that our students will use the dental laboratory, we must teach them enough, and give them sufficient experience, that they can direct the laboratory procedures with authority. They cannot do this if they have only done it once.

I said, at the beginning of this discussion, that the student must be taught what to do, when to do it, how to do it, why he does it, and that he should be skillful and experienced enough to be able to do it. This falls within the scope of this discussion of how much knowledge, technical ability, and experience are essential to the graduating dental student.

In order to get at the answers to these questions, let us follow the first complete denture patient of a dental graduate through the process of obtaining the service he requires. We can thus face the same problems the young dentist faces, and know what we should have taught him.

The patient will probably call for an appointment, and an appointment will be made for the examination. From this moment on, the young dentist must be prepared. He must know all the answers and must be able to do the job. He is confronted with his first problems before the patient arrives. What shall he say to the patient? What shall he tell the patient about the possible service? What shall he tell the patient about the cost of the service? We must supply the answers to these questions before the student leaves the dental school.

The patient arrives for his examination appointment. There are more problems to be solved by the young dentist. Some of these are: Is the case easy or difficult? Should he have x-rays? What should the x-rays tell him? What is the health of the tissue? Is there any pathology? Is surgery necessary to prepare the mouth? How long should he wait after the surgery? Are the ridges and their relations favorable or not? Is the coordination of the patient good? What is the condition of the bone in the alveolar process? What is the mental attitude of the patient? What does the patient expect? How can he improve on what the patient has? How should he figure his fee? Many other questions on diagnosis, prognosis, and patient management will come to his mind. He should know what should be done, when to do it, how to do it, and why he will do it, and he should be able to do it. We must give him sufficient experience to be able to answer, at least, some of the questions. We

should give him sufficient practice to develop the skill that is necessary to do the job.

Let us assume that he has the answers to the many questions, and that the patient returns for the service. More problems arise. What impression technique should he use? He should have more than one to choose from. What material should he use for the impressions? What is the correct way to use this material? How far should the impression be extended? How can he prevent gagging? How is the tray selected? What are the relations of the anatomic structures to the impression? Where should he provide relief? How will he know if the impression is good? How much pressure should he use in making the impression? And many, many other questions. He may even ask himself, "What were those fundamental requirements of an impression?" Or, "What was the sequence of steps in impression making?" The answers must have been supplied by the teachers in the dental college. He must have had the necessary experience and sufficient repetition of these operations to be sure of himself.

In the laboratory, after the patient is gone, he must make casts and occlusion rims. More questions. What cast material should he use? How thick should he mix it? How strong should the cast be? Should he box the impression? What separating media should he use? What material should he use for occlusion rims? How high should the rims be built? How can he make them fit the cast accurately? What are they supposed to do? These things should be second nature to him by now. We must make sure they are.

The patient returns for jaw relation records and for the selection of the teeth. Now the answers to the questions really become complicated. What about vertical dimension and centric relation? Which should he do first? How should he record them? Why and how should he make the protrusive records? Where should he place the occlusal plane? and the midline? Should he use the Gothic arch tracing and a central bearing point? What do they mean? What about the Bennett movement? What color of teeth should he use? and size? What shape of tooth? What kind of posterior tooth? How should he set them?

The questions pile up. The young graduate may give up and call on someone for advice who has had even less training than himself, the laboratory technician. The technician will not hesitate to tear down our teaching in order to prove his superiority so he may get business from our graduate. He will suggest techniques that our graduate may not know about. He will undermine our teaching by his salesmanship unless we have taught the student the fundamentals and have told him

about other techniques, their fallacies, and their merits. He must have been given a technique which will work satisfactorily for most denture patients. He must have repeated it often enough that he has become skillful in its use. He should be given a survey of other techniques so he will be able to know when they should be used. He should have a thorough understanding of the anatomy and physiology of jaw relations and jaw movement, and should know several methods for making the necessary jaw relation records.

After the teeth are selected, the graduate must make a choice of articulators and know how to use it and why. Then, when the casts are mounted on the articulator, he will be confronted by these questions. Where shall the anterior teeth be placed? How high or low shall they be set? What should be their labio-lingual position? How much irregularity should he make in their arrangement? What should he do about a disharmony of the size of the two jaws? Where should the posterior teeth be placed buccolingually? Where should the occlusal plane be located? When should teeth be omitted from the set-up? What is centric occlusion? How should the posterior teeth be arranged in centric occlusion? These and many other questions must be answered before the patient returns for the try-in. We must have given the student a fundamental understanding of the problems and the reasons for the answers so he will be able to remember the answers. He must be provided with experience to obtain the necessary skill to make the proper application of the fundamentals involved in the procedures.

When the patient returns for the try-in, the graduate must be prepared to cope with another series of questions. How shall he know if the recorded centric relation is correct? How critical of his records must he be? What should be his attitude toward the importance of centric relation? What should he do about a habit eccentric position? Why should the dentures be built in centric relation when the patient says he never bites in that position? How is he to verify the eccentric jaw relations? What effect do they have on the way finished dentures will work? These and many other questions must be answered. We must provide the graduate with enough fundamental background and experience to answer them. We must also provide him with a protection against the pressures of laboratory-promoted techniques that may lead him into the use of unsound procedures. We must give him practical training in the psychologic control of patients as well as in the biomechanical phases of denture construction.

The laboratory procedures of balancing the occlusion of the dentures and processing them will bring up a new set of questions. How much

vertical and horizontal over-lap should be used? Where should the posterior teeth be placed? How can balanced occlusion be developed when the ridge relations are out of harmony with each other? How should the occlusal plane be oriented? How much compensating curve should be used? What kind of base material should be used? How should the processing be done? How can the possible processing errors be avoided? How can they be corrected? How should the dentures be finished and polished?

The graduate must know all of the answers to these questions and to many more so he can tell the commercial dental laboratory exactly what to do and exactly how he wants it done. We must train him so he can direct this work properly if he does not do it himself. He must be prepared to protect himself and his patients against inadequate laboratory service.

When the dentures are seated in the patient's mouth, the graduate must know the answers to another group of questions. How should the dentures be tested? How should the occlusion be checked? When should remounting be done? How is it done? Why should it be done? What instructions should be given to the patient? When and how should adjustments be made? When and how should the fee be collected? There are many more.

I have not attempted to list all of the questions which the dental graduate must be prepared to answer. I have listed enough, however, to illustrate that complete denture prosthesis is not a simple mechanical operation. It is a science which involves more complicated procedures, and more fundamental background than any other branch of dentistry. These complicated procedures cannot be learned by the student doing them once. Repetition and more repetition are necessary if sufficient skill, experience, and judgment are to be attained.

Conclusions

The situations to be met in complete denture prosthesis vary more widely than any other dental service, with the possible exception of surgery. The public and the law expect our graduates to meet these situations, and to solve the problems involved in them. This requires that the graduate have the knowledge, the ability, and the skill to do the job.

The present trend is away from providing the graduates of the dental schools with the necessary time and experience to get this training. The content of the basic science courses should be evaluated on the

basis of how well they prepare the student to meet the problems of the practice of dentistry. Knowledge for knowledge's sake alone may be all right for the researcher, but for the graduating dentist, the basic sciences must have a practical application to the practice of dentistry. Either the basic science courses should be revised or their time should be cut to allow more time for the teaching of dentistry. The appropriation of time from prosthetics by basic science courses and by the addition of myriads of other courses must stop if we are to do an adequate job of teaching prosthetics.

It is time that the prosthetic teachers take the offensive and get back their fair share of the time which has been stolen from them. If this is not done, there is a growing danger that prosthetics will be taken from dentistry by the laboratories, or that it will be given to the laboratories by dental educators who do not practice prosthetics.

TEACHING COMPLETE DENTURE PROSTHESIS

STEPHEN P. FORREST, D.D.S.,[1] *Dallas*

The main objective in teaching complete denture prosthesis is to prepare the student to treat edentulous patients. This objective can be attained by directing the student through varying and appropriate levels of learning experiences. A successful beginning in preclinical studies is necessary with progress along lines of continuous growth as the student moves through the clinical years. The first group of prosthetic learning activities can begin during the sophomore year. At this time, development of knowledge and skill should be rapid because of the student's background of freshman subjects such as gross and microscopic anatomy, dental materials, chemistry, bacteriology, and dental anatomy. Greater growth in learning the fundamentals of treating edentulous patients is aided in its progress towards more mature levels with parallel studies in sophomore subjects such as physiology, pathology, radiology, and pharmacology. These learning experiences, along with those gained from treating edentulous patients in the clinic, and from associative clinical activities, prepare the undergraduate student for the higher and broader learning levels involved in the treatment of edentulous patients.

The following outline of major prosthetic *learning activities* can be developed for instructional purposes in teaching Complete Denture Prosthesis on both the preclinical and clinical levels:

1. The initial major learning activities include making objective examinations of the

[1]Department of Prosthetic Dentistry, Baylor University.

patient's oral and general health; making and interpreting oral radiographs; preparing the oral cavity; and recording the data
2. These activities are followed by the making of impressions and casts
3. Making acrylic denture bases and testing them for retention, stability, and comfort
4. Developing a maxillary occlusion and contour model
5. Recording and transferring the gleno-maxillary relationship to an adjustable articulator with a facebow
6. Determining and establishing vertical dimension of the mandibular denture space
7. Registering and recording centric jaw relation
8. Mounting the mandibular denture base in the articulator
9. Making protrusive relation records and effecting the adjustment of the articulator
10. Selecting and arranging prosthetic teeth for trial
11. Testing the trial dentures for retention, stability, jaw relations, inter-maxillary space, free-way space, occlusions, esthetics, and speech
12. Readjusting the articulator with protrusive relation records
13. Perfecting the articulation of teeth
14. Preparing the trial dentures for processing
15. Investing the trial dentures in stone, packing acrylic resin, trial-closing, curing, recovering, finishing, and polishing
16. Testing the dentures in the patient's mouth
17. Making a new centric relation record and remounting the mandibular denture in the articulator
18. Spot-grinding selectively to bring the teeth into balanced centric occlusion
19. Readjusting the articulator with a new protrusive relation record
20. Grinding and milling protrusive, lateral, and "rocking-fit" occlusions
21. Inserting and testing dentures
22. Giving instructions to the patient
23. Making examinations, treating oral tissues, adjusting dentures, and recording data during the adjustment period
24. Making recall appointments for further examinations and for making evaluations of the quality of service

These *learning activities* are adapted throughout the entire course to fill the educational needs of the student's advancing learning levels. Development of these activities is initiated on the sophomore level with the student observing an experienced teacher treating an edentulous patient. Slow motion pictures used now make this introduction more effective, however, should it be advisable to make more economical use of time, teacher, and student, these same slow motion pictures can be shown instead of the more desirable live demonstration. After this preview and orientation the student is directed through the activities with instructional aids such as manikins, other students, and edentulous persons contributing to appropriate learning situations. These learning situations are planned to approximate the clinical situations related to the treatment of the edentulous patient. The outcomes of these introductory activities are

the acquisition of preparatory knowledge and skill for student practice in the clinic.

In the clinical years the prosthetic *learning activities* are adapted to meet the needs and varying abilities of the student at advancing levels of learning. For purposes of illustration, a cooperative edentulous person having minor difficulties is referred for supervised treatment to the beginning junior clinical student. Later in the same academic year, the student is assigned another edentulous patient presenting different and more difficult problems of treatment. Then in the senior year, the student treats, under direction two edentulous patients each having increasingly more difficult problems of treatment and suited to the educative needs and advanced skills of the student. During the treatment of all patients evaluations of qualitative achievement are made and recorded by the teacher. These achievement records are available to all members of the staff for purposes of improving teaching and for furthering the development of the student.

In guiding the continuity of the student's development, the teacher makes use of many suitable educative agents. Lectures adjusted to the student's level of interest and progress are presented in a manner which encourages active teacher and student participation during the teaching period. For example, edentulous patients who have unusual problems are presented during the senior teaching period to stimulate interest, and critical thinking, and to permit the teacher to give useful information about the treatment. In view of the fact that prosthetic learning activities include both ideational and motor learning, instructional aids are used judiciously to contribute to the enrichment and development of the student's mental and movement skills. Instructional aids such as demonstrations, slides, slow motion pictures, models, manikins, patients, diagrams, and books are most effectively used when they are carefully adapted to the educative levels of the student. Further impetus is given the learning situation by encouraging the student to use the teacher's instructional aids at home and during school hours. Understanding is also favorably influenced by home and library study, provided the assignments of out of school work are made to meet the needs of the student at the appropriate learning level. These assignments in the text, library, or at home with suitably prepared study materials, should be well planned so that the student gains adequate rewards in learning experiences in return for effort expended in undertaking the work.

As the student's fund of knowledge and skills expands, evaluations of the progress of these accumulations are made in keeping with the changing

levels of prosthetic learning activities. These evaluations are made in the form of oral, written, observational, and manipulative tests; and with the purpose of using the results to improve teaching and learning, to improve guidance, and to prepare data for administrative responsibilities.

The desirable outcome of the undergraduate prosthetic *learning activities* is the acquisition of knowledge, skill, understanding, and attitude necessary in rendering treatment to the edentulous patient. A teacher's contributions to the attainment of these outcomes are immeasurable when constant guidance and stimulation is given to the student through the various enriching learning experiences. The totality of these experiences will enable the student to grow towards higher prosthetic educational levels, to move towards new frontiers of prevention, and to give support to those who dedicate their lives to serving edentulous persons.

Following the lines of least resistance—makes men, women and rivers crooked.

—ANON.

COLLEGE NEWS

Edited by SIDNEY EPSTEIN, D.D.S., *San Francisco*

Colorado Dental Foundation:

ANNOUNCEMENT

A seminar will be held on histo-pathology, June 21-25.

Columbia University:

ANNOUNCEMENT

Announcement is made of an all-day program of general professional interest by the Alumni Association on what they call Dean's Day, February 27.

Emory University:

ANNOUNCEMENT

Dedication of a new building, Woodruff Memorial Building, with a program through the period November 10-14, 1952.

APPOINTMENTS

F. L. Hiett, D.D.S., instructor, prosthetic dentistry.

Dr. Max Jacobs, visiting professor, oral pathology.

Mrs. Betty Edwards, instructor, anatomy.

Dr. Thomas Connor, Jr., assistant, oral surgery.

New York University:

ANNOUNCEMENTS

Announcement is made of a considerable number of graduate courses, information concerning which may be had from the school.

Graduate courses are offered in partial and complete denture service.

Ohio State University:

ANNOUNCEMENTS

Announcement of graduate courses for the first quarter of 1953 is made. Information may be had from the school.

Graduate instructions will be offered in procedure and materials at their Annual Assembly, April 22-23.

Temple University:

ANNOUNCEMENT

Announcement is made of a graduate course in occlusion presenting the fundamentals of this subject in relation to supporting tissues.

Tufts College Dental School:

ANNOUNCEMENTS

The fourth annual Berkshire Conference is scheduled for the middle of June—information from the school.

Graduate course of instruction will be offered in dental prosthetics October, 1953, to June, 1954.

Another course in oral pediatrics will be offered from June 15-19.

A number of courses are offered for a minimum period of 18 months leading to a Master's Degree.

APPOINTMENT

Dr. Louis Alexander Cohn, associate professor, dental prosthetics (graduate division).

University of California:

ANNOUNCEMENT

Announcement is made of the appointment of Wendell L. Wylie, A.B., D.D.S., M.S., as assistant dean.

University of California (Extension Division):

ANNOUNCEMENT

If you want a film, Shakespearian, with a literary educational intent, make inquiry of U.C.L.A., Extension Division, Los Angeles 24, California.

University of Illinois:

ANNOUNCEMENT

The university announces graduate and post-graduate instruction as follows: Basic Sciences, for Master of Science Degree and oral pathology.

University of Indiana:

ANNOUNCEMENT

This school announces graduate and postgraduate courses, information concerning which may be had from the school.

University of Pennsylvania:

ANNOUNCEMENTS

This school announces a World Conference on Endodontics to be held in the summer of 1953. Information may be had by addressing the school.

The school also announces several gifts from graduates of the school, in name of individuals or of the class. (This is a good idea. Ed.)

University of Southern California:

ANNOUNCEMENT

Announcement is made of the dedication of a new clinic building last October and an address by the Dean of Washington University Dental School and President of the American Dental Association, Doctor Otto W. Brandhorst.

University of Washington:

ANNOUNCEMENT

Refresher course is offered in exodontia and minor oral surgery March 9-20.

Laying stress upon the importance of work has a greater effect than any other technique of living in the direction of binding the individual more closely to reality.

—SIGMUND FREUD.

BOOK REVIEWS

The Teaching of Religion in American Higher Education. This is a five-chapter book, consisting of 158 pages with an index, each chapter written by different authors, the first chapter being written by the editor of the book, Christian Gauss, dean emeritus of Princeton University. Dr. Gauss is well known throughout the education world, and his administration concerning the teaching of religion is well worth considering because of its moral and ethical principles, as well as the spiritual value of religion itself. Published by Ronald Press, New York, N. Y.

Applied Physiology. This is a well illustrated book of 1190 pages, including an index. It is the 9th edition by Samson Wright, M.D., F.R.C.P., John Astor, professor of physiology of London University. In this last edition he is assisted by Montague Maizels, M.D., F.R.C.P., professor of clinical pathology, University College Hospital, University of London; and John B. Jepson, M.A., B.Sc., D.Phil., A.R.I.C., senior lecturer in biochemistry, Middlesex Hospital, Medical School, London. Published by Oxford University Press, London, New York, Toronto. Price, $9.00.

Annual Report 1951, National Bureau of Standards. National Bureau of Standards Miscellaneous Publication 204, 105 pages, 28 halftone illustrations. Fifty cents (order from Government Printing Office, Washington 25, D. C.).

Summarizing scientific and engineering investigations conducted by NBS during the fiscal year 1951, this booklet contains accounts of current activities as well as more detailed descriptions of especially important scientific developments. Its text provides a general description of work done in the 15 scientific and technical divisions and gives many specific examples of significant projects at NBS during the year.

Old Instruments for Extracting Teeth. This is a pleasing story of 245 pages, including an index, showing pictures of and discussing, as the title indicates, instruments used throughout the past for extracting teeth. There is much public comment concerning this book to the effect that the author has covered the subject very completely. The author is a well known writer and clinician, Sir Frank Colyer, LL.D., F.R.C.S. Published by Staples Press, 70 45th Street, New York. Price, $8.50.

Annual Report General Education Board. This is the 1951 Annual Report of this board founded originally by John D. Rockefeller in 1902. The purpose of this board is the distribution of funds among areas in the United States requiring aid. There are no public contributions to either medical or dental except as one or the other or both may be included in humanities. Gifts are extended in the large part to negro schools, but to negro and white schools both, in "a search for talent." It is an informative report, interesting to read and may be had by application to the board at 49 W. 49th Street, New York.

Injuries to the Teeth of Children. This is the third edition of this little book by the well-known author, Dr. Roy G. Ellis, dean of the faculty and professor of operative dentistry, University of Ontario. It consists of 247 pages, 5¼ x 3¼ inches, including an index. It is well illustrated and is a valuable book to those practicing Pedodontia. Published by Yearbook Publishers, Inc., Chicago. Price, $4.25.

Moral Theory of Behavior. This is the title of a monograph of 34 pages, including an index, by Frank R. Barta, M.D., F.A.C.P., director, department of psychiatry and neurology, Creighton University School of Medicine. It is submitted

as "A New Answer to the Enigma of Mental Illness," including an index, but it is packed full of material and data, as a result of which the author has formed the following hypothesis:

"Ideally each person should be taught or learn to expect of himself and others exactly that which is objectively justifiable on the basis of individual native capacity. Actually, no one ever succeeds in acquiring such ideal attitudes, since it is human to err. However, if our attitudes approximate objective truth sufficiently, we are "normal" and well adjusted. Those taught to deviate (unknowingly) to a somewhat greater extent are usually considered "queer," eccentric, or prejudiced. Somewhat greater degrees of deviation result in psychoneuroses of various types. The greatest degrees of deviation occur in those prone to develop psychoses."

This little book is a valuable contribution to the study of that condition of mind in which we find so many people in these war-torn days. Published by Charles C. Thomas Company, 301-327 E. Lawrence Ave., Springfield, Ill. Price on application.

A Manual of Oral Surgery. This is the title of a new book by one well known among us, W. Harry Archer, B.S., M.A., D.D.S. Dr. Archer is professor of oral surgery and anesthesia, School of Dentistry, University of Pittsburgh. He has presented a book of 643 pages, including an index, and profusely illustrated with 1,036 figures. This is a book which should be of no little value, not only to those practicing oral surgery but to the average dentist in practice as well. The first two paragraphs appear to be of such importance as to warrant quoting in full: "The extraction of teeth, however accomplished, is a surgical operation involving bony and soft tissues of the oral cavity, access to which is restricted by the lips and cheeks, and further complicated by the movement of the tongue and mandible. An additional hazard is that this cavity communicates with the pharynx, which in turn opens into the larynx and esophagus. Furthermore, this field of operation is flooded by and is inhabited by the largest number and greatest variety of microorganisms found in the human body. Finally, it lies close to the vital centers.

"It is essential, therefore, that this phase of oral surgery be given the same careful study and application of sound surgical principles as is given to surgery in any other part of the human body. No operation performed by the dentist is fraught with such great danger to the patient as those of oral surgery, a large part of which is extraction of teeth."

Published by W. D. Saunders and Company. Price, $15.00.

The Rockefeller Foundation. This is the annual report of this foundation in its support of various phases of education. It might be a consideration of special importance at this time because of studies in international relations and in the problems of aging. It is published by the foundation at 49 West 49th Street, New York, and may be had for the asking.

Accepted Dental Remedies (ADR). This is the 18th edition of this well-known publication by the Council of Dental Therapeutics of the American Dental Association. It is up-to-date in its inclusion of accepted products and "other information compiled to promote therapeutics in dentistry." Each of the 18 issues has proved larger than the preceding. This one is no exception inasmuch as it contains 208 pages, including an index with many tabulations and graphic formulae. Published by the American Dental Assocation, Chicago. Price $2.00.

Oral Anatomy. This is the second edition of this book by the author, Harry Sicher, M.D., D.Sc., professor of anatomy and histology, Loyola University, School of Dentistry, Chicago. It is complete with 529 pages, an index and 310 illustrations,

including 24 in color. A critical review will be published shortly. Published by C. V. Mosby Company. Price, $13.50.

Hospital Formulary (University of California). This is a little book of 318 pages with an index consisting, as its title indicates, of drugs, pharmacologic action, dose and mixtures with other drugs in the treatment of disease and diseased conditions. It is adapted to the use of three departments of health service, namely, medicine, dentistry and pharmacy, and in a measure is comparable to the ADR of the American Dental Association. Published by the University of California Press. Price on application.

Oral Surgery. This is the second edition of this book by the well-known author, Kurt H. Toma, D.M.D. This edition consists of two volumes with a total of 2550 pages, including an index. It contains 1789 illustrations with 121 in color. It is profusely illustrated, well bound and should prove a valuable book to the man in general practice. Published by C. V. Mosby Co. Price, $30.00.

Newer Concepts of Inflammation. This is the title of a little book by Valy Menkin, professor of experimental pathology at Temple University, School of Medicine. It is, as the title indicates, a new concept of the inflammatory process and should be of no small interest to Indodontists. It consists of 145 pages with an index and is well illustrated in black and white. Published by Chas. C. Thomas, Springfield, Illinois. Price: To be had on application.

Erratum

In the announcement of "Oral Anesthesia," by Archer, published by W. B. Saunders Company in the last issue of the JOURNAL, the price of the book was inadvertently omitted. The price is $5.50.

It's said of the scientist, Faraday, that when he was a boy, he put his head and arms through the ironwork of a gate, and being a philosopher he then asked himself: "If my head is on one side of the gate and my heart and my body on the other, on which side am I?"

General Information

Address all correspondence relating to manuscripts and copy for publication in this JOURNAL to the editor, John E. Gurley, University of California, College of Dentistry, The Medical Center, San Francisco 22, California.

Address correspondence concerning sale of the JOURNAL and advertising space to the business manager, Charles W. Craig, University of California, The Medical Center, San Francisco 22, California.

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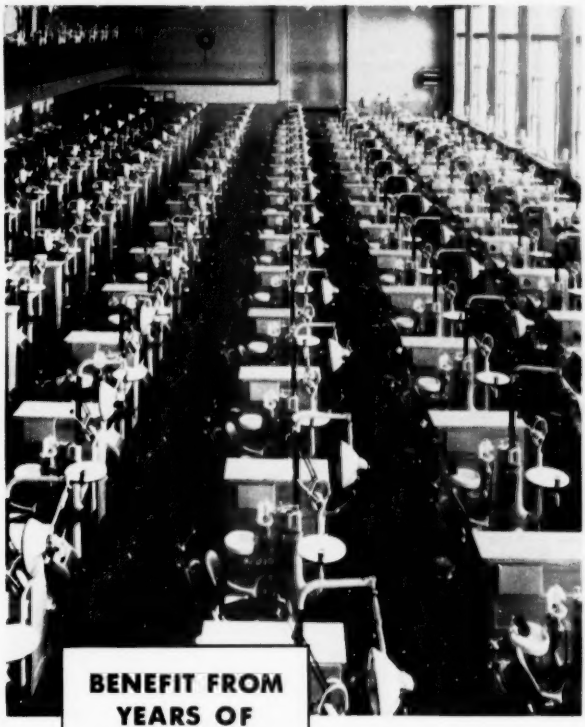

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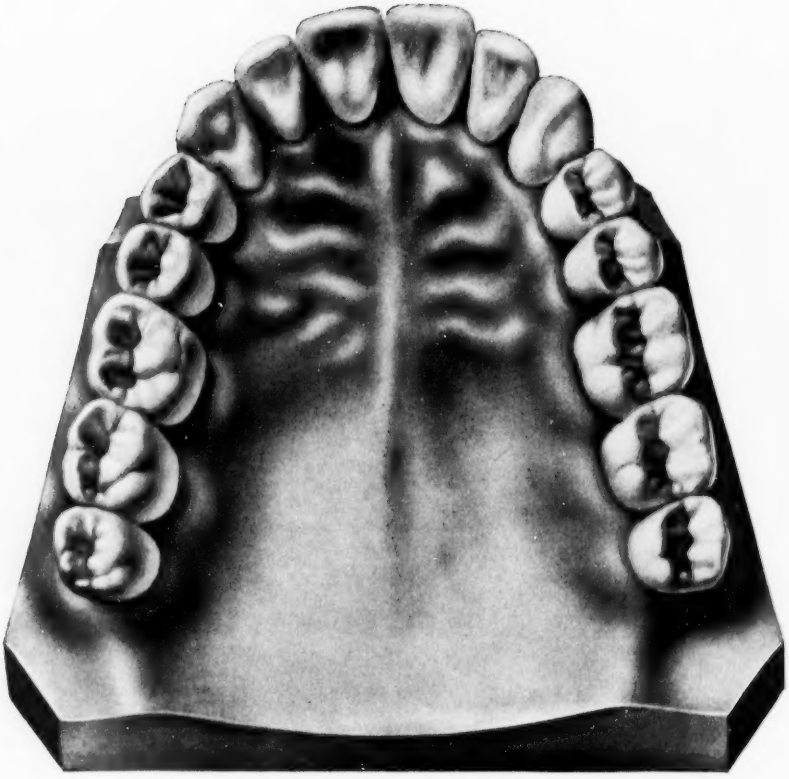

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